

ABSTRACT OF THE DISCLOSURE

A method for forming an array of zinc oxide nanowires on a substrate is disclosed, which includes forming a crystal phase adjusting buffer on the surface of the substrate and growing 1D zinc oxide nanowires on the buffer by zinc vapor deposition, which are normal to the surface of the substrate. The crystal phase adjusting buffer includes, for example, nitride and oxide layers on a silicon substrate, or a gallium nitride epitaxial layer on a sapphire substrate, and is used as a growth buffer layer for the zinc oxide nanowires. The zinc vapor phase deposition includes forming a zinc oxide layer on the crystal phase adjusting buffer and forming vertical zinc oxide nanowires on the zinc oxide layer.